Michigan Department of Agriculture
Draft Installer Manual Supplement for Direct Loading Milk
February 10, 1999

Facilities shall be provided to properly sample milk on the farm as provided in the Pasteurized Milk Ordinance.

These facilities will include an enclosed building to house the milk tank truck that can be adjacent to, but not part of the milkroom (milkhouse). It shall be maintained as a milkroom with respect to construction, light, drainage, insect and rodent control, and general maintenance. See Appendix B of the 1995 PMO. An in line temperature recorder shall be provided and located to record the temperature of the milk after it leaves the chiller and prior to entering the milk tank truck. Additionally, an electronic means of providing a signal to warn operators that the milk tank truck is filling to near capacity shall be provided.

The milk shall be cooled to 7°C (45°F) or less prior to loading on the milk tank truck, and maintained at 0° to 7°C (32° to 45°F).

Milk shall to be properly agitated to meet the requirements outlined in *Standard Methods for the Examination of Dairy Products* prior to sampling.

Agitators:

1. Mechanical agitators: The 3-A Sanitary Standards specify types of equipment or mechanical agitators acceptable for use in bulk milk operations, weigh tanks, vats, and storage tanks. Air systems used for agitation must comply with the applicable 3-A Sanitary Standard (*3-A Accepted Practice for Supplying Air Under Pressure in Contact with Milk, Milk Products, and Product Contact Surfaces, 604 - or see section on Air Under Pressure, below)* for odor-free, oil-free, filtered air.

2. The following methods may be used to agitate milk tank trucks:
   a. A mechanical agitator built into the tank truck.
   b. A propeller or agitator placed through the manhole with the agitator suspended in the milk.
   c. An approved sanitary tank washer/air agitator system, permanently installed in the tank, through which 3-A quality air enters and agitates the milk. This method of agitation is not recommended unless an approved clean-in-place (CIP) system has been installed at the receiving plant.

d. A milk pump, attached by hose to the tanker outlet valve and to the manhole vent opening or to a second tanker outlet/inlet valve, permits recirculation and mixing of the milk.

3. All agitation equipment must be properly cleaned, stored and sanitized prior to use.

Agitation:

1. Requirements for milk tank trucks (farm pickup trucks and over-the-road tankers) are as follows: The time required to agitate a tank of milk until it is homogeneous is determined by size and shape of the tank, volume of the product held, type, location, and number of agitators on the tank, force of the agitator, and time allowed for creaming before starting agitation. Therefore, it is necessary to determine for an individual milk tank truck how much agitation time is needed to ensure homogeneity of its contents.

2. Agitation time for milk tank trucks may be determined by taking a series of milk fat samples at specified intervals (e.g., 3 minutes, 4 minutes, 5 minutes) during the mixing until at least five milk fat tests stabilize at a definite value. From a full tank, where possible, take samples from the top, bottom, and from points near to and far from the points of agitation.

3. Adequate agitation is that degree of agitation which, at full tank will result in the milk fat content of the product in the tank varying by not more than two standard deviations from the mean. Refer to the current edition of *Standard Methods for the Evaluation of Dairy Products*, maintained at most milk laboratories, for this procedure.

4. When appropriate time for agitation has been determined for each milk tank truck, record and use it as the guide for proper agitation time for samples from that specific tank.

5. **Note: Improper agitation will result in erroneous butterfat and drug residue tests with drug residue incidents being more likely to occur in an improperly agitated, high fat sample.**

6. **Note: The producer must verify to the Michigan Department of Agriculture that proper agitation times have been established for each direct load tanker, using the above methods.**

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Requirements for Air Under Pressure:

MILK AND MILK PRODUCT CONTACT SURFACES

MATERIAL

Filter Media -- Air intake and pipeline filters shall consist of fiberglass, cotton flannel, wool flannel, spun metal, electrostatic material or other equally acceptable filtering media, which are non-shedding and which do not release to the air, toxic volatiles, or volatiles which may impart any flavor or odor to the product.

Disposable media filters shall consist of cotton flannel, wool flannel, spun metal, non-woven fabric, U.S.P. absorbent cotton fiber or suitable inorganic materials which, under conditions of use, are non-toxic and non-shedding. Chemical bonding material, contained in the media, shall be nontoxic, nonvolatile and insoluble under all conditions of use. Disposable media shall not be cleaned and reused.

Filter Performance --The efficiency of intake filters shall be at least 50 percent as measured by the National Institute of Standards and Technology's "Dust Spot Method" using atmospheric dust as the test aerosol.

The efficiency of either air pipeline filters or disposable filters shall be at least 50 percent as measured by the DOP (Dioctyl 1-phthalate fog) test.

Piping -- Air distribution piping, fittings and gaskets between the terminal filter and any product-contact surface, shall be sanitary milk piping, except, where the compressing equipment is of the fan or blower type. When the air is used for such operations, as removing containers from mandrels, other non-toxic materials may be used. See attached illustration for typical installation.

FABRICATION AND INSTALLATION

Air Supply Equipment -- The compressing equipment shall be designed to preclude contamination of the air with lubricant vapors and fumes. Oil-free air may be produced by one of the following methods or their equivalent:

1. Use of a carbon ring piston compressor.
2. Use of oil-lubricated compressor with effective provision for removal of any oil vapor by cooling the compressed air.
3. Water-lubricated or nonlubricated blowers.

The air supply shall be taken from a clean space or from relatively clean outer air and shall pass through a filter upstream from the compressing equipment. This filter shall be located and constructed so that it is easily accessible for examination, and the filter media are easily removable for cleaning or replacing. The filter shall be protected from weather, drainage, water, product spillage and physical damage.

Moisture Removal Equipment -- If it is necessary to cool the compressed air, an aftercooler shall be installed between the compressor and the air storage tank for the purpose of removing moisture from the compressed air.

Filters and Moisture Traps -- Filters shall be constructed so as to assure effective passage of air through the filter media only.

The air under pressure shall pass through an oil-free filter and moisture trap for removal of solids and liquids. The filter and trap shall be located in the air pipeline, downstream from the compressing equipment, and from the air tank, if one is used. Air pipeline filters and moisture traps, downstream from compressing equipment, shall not be required where the compressing equipment is of the fan or blower type.

A disposable media filter shall be located in the sanitary air pipelines upstream from and as close as possible to each point of application or ultimate use of the air.

Air Piping -- The air piping from the compressing equipment to the filter and moisture trap shall be readily drainable.

A product-check valve of sanitary design shall be installed in the air piping, downstream from the disposable media filter, to prevent backflow of product into the air pipeline, except that a check valve shall not be required if the air piping enters the product zone from a point higher than the product overflow level which is open to the atmosphere.

The requirements of this section do not apply when the compressing equipment is of the fan or blower type. See illustrations depicting various air supply systems.

NOTE. -- For additional details, see *3A Accepted Practices for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product-Contact Surfaces.*

Duplicate samples with temperature control samples shall be taken, with one set to travel with the milk tank truck to the receiving point for delivery to a certified laboratory for official analysis. The other set of samples is to be retained at the milking facility under proper

refrigeration 0° to 4.4°C (32°to 40° F) for no less than 7 days. Either sample shall be made available to the Michigan Department of Agriculture for regulatory purposes, upon request.

Analysis results for official samples must be reported to the Michigan Department of Agriculture a minimum of four times in a six-month period. Two official samples may be collected in a single month if they are collected at least 20 days apart. These results must be from a certified laboratory listed in the quarterly Interstate Milk Shippers List. The analyses required are temperature, raw bacteria count, somatic cell count and inhibitory substances. It is the responsibility of the milk producer to submit the required samples for official analyses.

Care and Storage of Samples:

Labeling, handling, and storage of samples must comply with the requirements of the PMO, and Michigan Department of Agriculture Regulation 407, Milk Manufacture. Copies of Regulation 407 and excerpts of the PMO are available from the Michigan Department of Agriculture upon request.

Weights from *an approved* scale will be acceptable for the official measurement of the milk being offered for sale. Milk weights from milk metering devices currently are not acceptable for official purposes if the milk meter is certified by the Michigan Department of Agriculture Weights and Measures.

Calibrated stick measurements for a milk tank truck will not be accepted as an official weighting method unless it can be demonstrated that accurate measurements can be obtained.

When a producer is direct loading a milk tank truck at one facility, and will be picking up from farm bulk milk tanks at other owned or operated facilities, a means must be provided to establish the weight of the milk collected from each location. Furthermore, samples must be collected from each location using proper sampling procedures.

Samplers must be certified samplers or licensed milk haulers.

Contact the Michigan Department of Agriculture for certification or licensing.

RECORDING THERMOMETERS USED IN STORAGE TANKS

Temperature recording devices shall meet the requirements of the following:

Case -- Moistureproof under operating conditions.

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Scale -- Shall have a scale span of not less than 28 Celcius degrees (50 Fahrenheit degrees) including normal storage temperature, plus and minus 3°C (5°F), graduated in not more than 1°C (2 °F) divisions, spaced not less than 1 millimeter (0.040 of an inch) apart, are permitted when the ink line is thin enough to be easily distinguished from the printed line and graduated in time scale divisions of not more than 1 hour, having a chord of straight-line length of not less than 3.2 millimeter (0.125 of an inch) at 5°C (40° F). Chart must be capable of recording temperatures up to 83°C (180 °F). (Span specifications do not apply to extensions beyond 38°C or 100°F.

Temperature Accuracy -- Within 1°C (2 °F), plus or minus, between specified range limits.

Pen-Arm Setting Device -- Easily accessible; simple to adjust.

Pen and Chart Paper -- Designed to give line not over .635 millimeter (0.025 of an inch) thick when in proper adjustment; easy to maintain.

Temperature Sensor -- Protected against damage at 100°C (212 °F).

Stem Fittings -- Pressure-tight seat or other suitable sanitary fitting. No threads exposed.

Chart Speed -- The circular chart shall make one revolution in not more than 7 days and shall be graduated for a maximum record of 7 days. Strip chart shall move not less than 25 millimeter (1 inch) per hour and may be used continuously for 1 calendar month.

Washing the Milk Tank Truck:

The milk tank truck shall be washed and sanitized at the dairy plant receiving the milk or at a wash station acceptable to the regulatory agency. Wash tags must be affixed to the milk tank truck

Prevention of Overfilling the Milk Tank Truck:

To prevent overflow from the milk tank truck, which would create unsanitary conditions around the milk room, the milk tank truck shall be equipped with a liquid level sensor device of sanitary design. The sensor device shall deactivate the pump or sound and alarm when activated. A milk meter of 3-A sanitary design would be acceptable as a sensor device when properly wired.

Special approval will have to be given by the Michigan Department of Agriculture for any deviation in these procedures.

Figure 33.
Individual Compression-Type Air Supply.

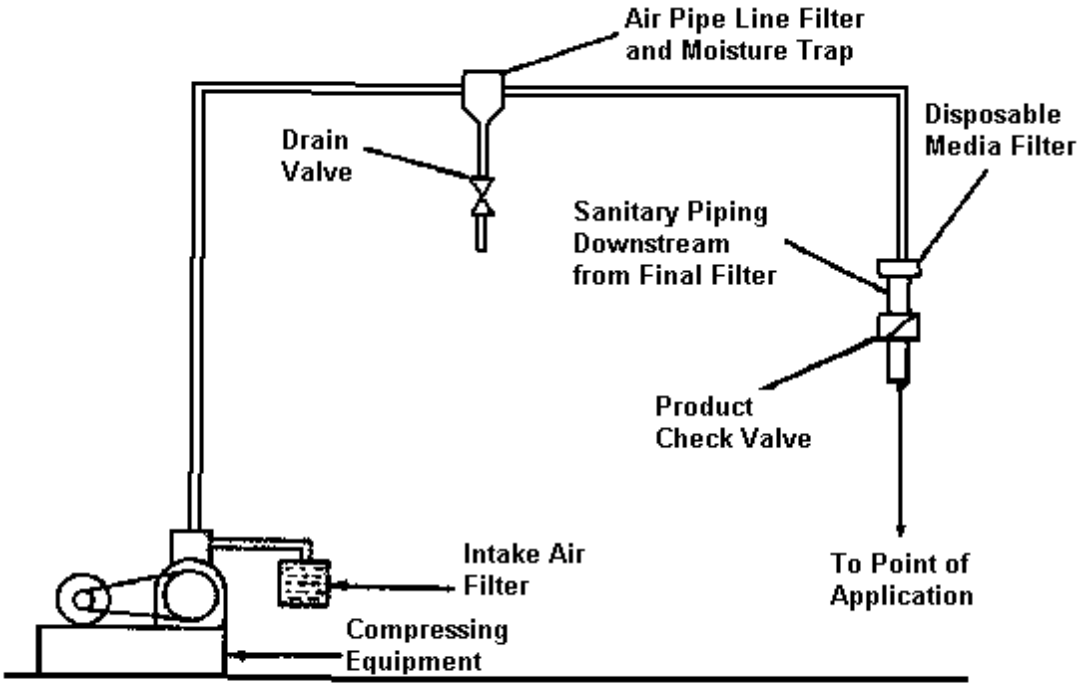

Figure 34.
Central Compression-Type Air Supply

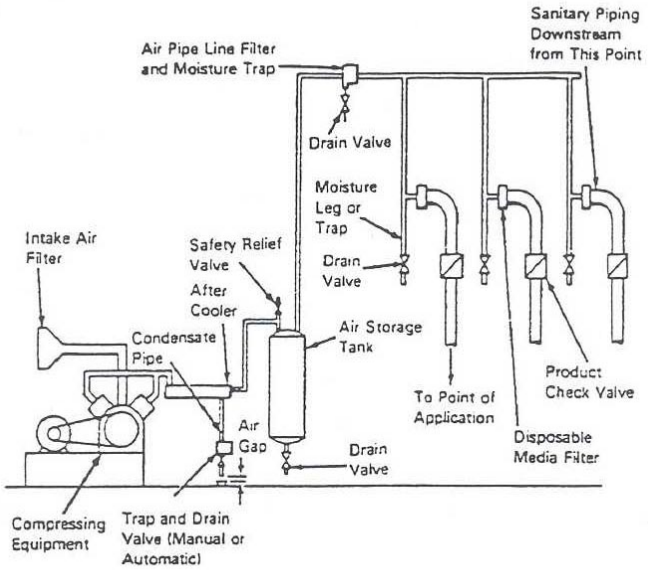

Figure 35.
Individual Blow Type Air Supply